Draft Environmental Impact Statement and Land Management Plan

Watts Bar Reservoir

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DRAFT ENVIRONMENTAL IMPACT STATEMENT

WATTS BAR RESERVOIR LAND MANAGEMENT PLAN

Loudon, Meigs, Rhea, and Roane Counties Tennessee

MAY 2005

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Draft Environmental Impact Statement **May 2005**

Proposed project: Watts Bar Reservoir Land Management Plan
Loudon, Meigs, Rhea, and Roane Counties Tennessee

Lead agency: Tennessee Valley Authority

Cooperating agencies: None

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Comments must be submitted by July 5, 2005

Abstract: TVA is proposing to update the 1988 Watts Bar Reservoir Land Management Plan (1988 Plan) for approximately 16,000 acres of TVA public land on Watts Bar Reservoir in Loudon, Meigs, Rhea, and Roane Counties, Tennessee. The proposed updated Reservoir Land Management Plan (Plan) would guide land use approvals, private water use facility permitting, and resource management decisions on Watts Bar Reservoir. The proposed Plan allocates land into broad categories or "zones," including Project Operations, Sensitive Resource Management, Natural Resource Conservation, Economic Development, Developed Recreation, and Shoreline Access.

Three alternatives are proposed in the Draft Environmental Impact Statement. Under Alternative A (No Action) TVA would continue to use the 1988 Plan with minor updates to reflect the changes that have been made over the past 17 years. Alternative B (Balanced Development and Recreation) would update the Plan to provide a stronger emphasis on economic development and developed recreation. Alternative C (Balanced Conservation and Recreation) would update the Plan to provide a stronger emphasis on natural resource conservation and informal recreation activities.

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SUMMARY

PURPOSE OF AND NEED FOR ACTION

The Tennessee Valley Authority (TVA) manages its public lands to generate prosperity, protect and enhance natural resources, and improve the quality of life in the Tennessee Valley. TVA is proposing to update the 1988 Watts Bar Reservoir Land Management Plan (1988 Plan) to reflect changing, community needs and current TVA policies. This includes allocating additional public lands on the reservoir that were not previously allocated in the 1988 Plan. These additional lands include narrow shoreline strips, TVA operation areas, and lands committed under legal agreements.

The purpose of this Environmental Impact Statement (EIS) is to assess the potential environmental impacts of a reasonable range of alternatives for allocating 16,000 acres of TVA public land on Watts Bar Reservoir and provide a means to involve the public in the decision-making process. The purpose of the land planning effort is to apply a systematic method of evaluating and identifying the most suitable use of public land under TVA stewardship. This method includes public input, resource and computer analysis, and review by TVA staff expertise. These methods are then used to allocate land into one of the following land-use categories or zones: Project Operations, Sensitive Resource Management, Natural Resource Conservation, Economic Development, Developed Recreation, and Shoreline Access. These allocations are then used to guide the types of activities considered on each parcel of land.

As part of the updated Plan, TVA also proposes to implement and use an Integrated Resource Management (IRM) approach to manage multiple public uses and resources on lands allocated for Project Operations, Sensitive Resource Management, Natural Resource Conservation, and Developed Recreation. TVA recognizes that the management or use of one resource often affects the management and use of other resources. IRM establishes a process and schedule to manage these multiple resources in conjunction with stakeholder input.

The Watts Bar Reservoir, which is part of the Watts Bar Project, is a multipurpose reservoir operated by TVA for navigation, flood control, power production, recreation, and economic development. The Plan is intended to be consistent with the purposes of the Watts Bar Project. The Plan also seeks to address issues and concerns raised by the general public. Each reservoir land management plan is submitted for approval to the TVA Board of Directors and adopted as policy to provide for long-term stewardship and accomplishment of TVA responsibilities under the TVA Act of 1933.

ALTERNATIVES

TVA is considering three alternatives for managing 16,000 acres of public land around Watts Bar Reservoir. Under Alternative A (No Action), TVA would continue to use the existing 1988 Plan, with minor revisions to reflect allocation changes made over the past 17 years and current TVA policy. The Action Alternatives (Alternative B and C) would make substantial changes to the 1988 Plan and guide future land use decisions. These proposed changes are based on evaluations, collected reservoir data, public input, and technical staff input. Under the Alternative B (Balanced Development and Recreation), TVA would enhance economic and recreation potential by allocating 9 parcels to Zone 5, Economic Development and Zone 6, Developed Recreation. Under Alternative C (Balanced

Conservation and Recreation), TVA would enhance conservation and informal recreation potential by allocating 12 parcels to Zone 4, Natural Resource Conservation; or Zone 6, Developed Recreation; and implementing all of the proposed IRM-based activities. After TVA has reviewed all comments from the draft EIS, TVA staff will recommend a preferred alternative to the TVA board for approval. TVA's selected alternative would guide TVA resource management and property administration decisions on the TVA public land surrounding Watts Bar Reservoir until the Plan is revised in response to changing needs.

AFFECTED ENVIRONMENT

At normal summer pool, Watts Bar Reservoir extends 72.4 miles up the Tennessee River to Fort Loudoun Dam, and 62.5 miles to Melton Hill Dam on the Clinch River. It also includes parts of the Emory and Little Emory Rivers, and the shoreline length is 721 miles. Watts Bar Reservoir flows from the northeast to southwest through Loudon, Meigs, Rhea, and Roane Counties in East Tennessee. TVA public land surrounding the Reservoir includes TVA managed Natural Areas, Habitat Protection Areas, land fronting residential development, Wildlife Management Areas, forest areas, licensed recreation areas, power transmission line corridors, riparian/wetland areas along streams and the reservoir shoreline, and Kingston Fossil Plant, Watts Bar Nuclear Plant, and the Watts Bar Dam Reservation. Privately-owned land surrounding the Reservoir is a mosaic of residential and industrial/commercial development, upland and bottomland forests, and farmland comprised of hay, pasture, row crops, and small woodlots. The Reservoir is, in landscape character, similar to other reservoirs in the Tennessee River system. Substantial visual features throughout the reservoir also include secluded coves and large islands where vegetation and wildlife populations abound, shoreline areas that serve as a visual buffers, and isolated areas of visual significance, such as undisturbed, pristine parcels amidst cluttered scenery.

The numerous plant communities on Watts Bar Reservoir provide suitable habitat for a variety of wildlife species. These diverse plant communities include pine/hardwood forests, upland and riparian hardwood forests, and old field and agricultural field habitats. In addition to distinctive vegetated communities, many features, such as forested and emergent wetlands, streams, limestone bluffs, and caves, on reservoir parcels provide unique habitats for wildlife. In the four county area around Watts Bar Reservoir there are 37 plant species that are protected by the state Tennessee, 12 of these species occur on TVA land. No federal-listed plant species are known to exist on TVA land.

The various plant communities on Watts Bar Reservoir provide suitable habitat for a variety of federal and state listed terrestrial animals. These diverse communities include pine forests, mixed hardwood/conifer forest, upland and riparian hardwood forest, wetland, early successional and agricultural lands. Forest stands consist of a mixture of hardwoods and pine; however, recent infestations of southern pine bark beetle have greatly the reduced numbers of pine stands in the vicinity. In addition to distinctive vegetated communities, many features such as streams, caves, rock outcrops, and sinkholes found on Watts Bar Reservoir lands provide unique habitats for rare species of wildlife. Although large stands of contiguous forest exist on Watts Bar Reservoir lands, a large portion of the reservoir lands have been developed, primarily for housing developments. This has resulted in fragmenting many of these plant communities.

The various aquatic and terrestrial habitats in the vicinity of Watts Bar Reservoir provide suitable habitat for several species of federal- and state-listed species of wildlife. Fourteen

listed terrestrial animal species, approximately 24 caves, and 37 heron colonies were identified from the project area. Two of these terrestrial animals are protected by the U.S. Fish and Wildlife Service and the remaining 12 are protected by the state Tennessee. Suitable bald eagle and Osprey nesting, foraging, and wintering habitat are found along Watts Bar Reservoir on parcels which support large areas of middle-age and mature woodlands. Bald eagles have been documented nesting within five parcels of TVA land on Watts Bar Reservoir; they also regularly roost at various sites along the reservoir during winter months. Watts Bar has one of the largest populations of nesting osprey compared to other reservoirs on the Tennessee River Valley. Gray bats are listed as federal-endangered and gray bat colonies are known to occur in six caves in the vicinity of Watts Bar Reservoir. Only one of these caves is located on Watts Bar Reservoir land which they currently use for a roost on a transitional basis during spring and fall migration. Indiana bats have not been observed in caves on Watts Bar Reservoir land in recent years, however, mature hardwood forest communities on the Reservoir provide suitable summer habitat for Indiana bats. Historical records indicate that Tennessee State protected species and habitats exist on Watts Bar Reservoir land, these are; the Eastern Hellbender, Four-toed Salamander, Tennessee Cave Salamander, Bachman's Sparrow, Barn Owls, Least Bitterns, Sharp-shined Hawks, Eastern Small-footed bats, Indiana Bats, Southeastern Shrews, Southern Bog Lemmings, Eastern Slender Glass Lizards, and Northern Pine Snake. The establishment of heron colonies on Watts Bar Reservoir is significant. The establishment of new colonies suggests that Watts Bar Reservoir may provide suitable nesting habitat for other species of wading birds that are considered uncommon in Tennessee.

The TVA Regional Natural Heritage database indicated that there are nine mussels, one snail, and six fish from the waters now included in vicinity of Watts Bar Reservoir which are protected as state- and federal-listed endangered or threatened species. However, five of the mollusks species, including Anthony's River Snail, are believed to be extirpated from the reservoir. Currently, there are four federal-listed mussels and one state-listed mussel, and two federal-listed and four state-listed fish, are known from the areas included in the Plan.

There are 27 Managed Areas or Significant Ecological Sites on or in the vicinity of public lands on Watts Bar Reservoir. Seven of the areas, including Meigs County Park, Steekee Creek Park, Southwest Park, Kingston City Park, Roane County Park, and the City of Rockwood Park are managed for recreation. Five of the areas—Paint Rock State Wildlife Refuge, Watts Bar Wildlife Management Area, and Kingston Fossil Plant Wildlife Observation Area, Kingston Refuge, and the Oak Ridge State Wildlife Refuge—are managed for recreation and resource management. Two areas at Fooshee and Whites Creek are designated as Small Wild Areas with exceptional natural, scenic, or aesthetic qualities and are suitable for low-impact public use. Several areas, Marney Bluff, Marble Bluff, Polecat Creek Slopes, Grassy Creek, Sugar Grove, Rayburne Bridge, and Stowe Bluff are TVA Habitat Protection Areas, which along with two protection planning sites, two potential Natural Landmarks, and the Oak Ridge National Environmental Research Park Biosphere Reserve are managed and/or monitored for federal- and/or state-protected species. Finally, segments of the Emory and Little Tennessee Rivers, and Piney Creek, which are tributary to Watts Bar Reservoir, are listed on the National Rivers Inventory.

The overall Reservoir Ecological Health rating for Watts Bar Reservoir was fair in 2004. Ratings declined from good to poor between 1994 and 2002. Most of the water entering Watts Bar reservoir originates outside the immediate watershed, so the overall water quality

characteristics of the reservoir are strongly affected by waters outside of the local watershed. The water quality characteristics of the embayments are, however, more apt to exhibit a response to pollutant loadings and changes in land use within the local area than the main river region.

Sediment quality rated good at the forebay and fair at the transition due to elevated arsenic levels. The sediment quality ratings have varied from good to fair (1991-2003) with a greater frequency of occurrence of organic chemicals (mainly polychlorinated biphenyls (PCBs) and chlordane) in recent years. Chlordane and PCBs were commonly used in a variety of commercial products, as well as during past operations of the United States Department of Energy's (USDOE) Oak Ridge Reservation. Institutional controls (warning signs, fish consumption advisories, and monitoring) are in place to reduce health and environmental risk.

The aquatic bottom dwelling (benthic) animal community in Watts Bar Reservoir rated from poor to excellent in comparison to other run-of-the-river reservoirs. The mid-reservoir transition station had the best overall benthic community, rating fair or better each year. In 2004, the benthic community rated excellent at this station. Otherwise throughout Watts Bar Reservoir, benthic communities rated generally poor, although there may be an improving trend since 2002. Of the seven parameters used to evaluate the benthic community, two received the highest possible rating at most of the sites in 2004.

With only two exceptions since 1994, vital stations fish community monitoring results have rated fish communities as 'good' in Watts Bar Reservoir. This indicates a consistently well-balanced fish assemblage over time. In 2004 sampling, overall species diversity was good, as were the diversity of top carnivores, and the low incidence of anomalies. Lower ratings were seen in percent tolerant individuals, percent of omnivores.

Depending upon topography, forested wetlands have developed over time in the riparian and floodplain zones now affected by reservoir operations. Emergent and scrub-shrub wetlands have also developed in the embayments and mouths of tributary streams as they enter the reservoir. Especially significant areas of wetlands occur in the embayments associated with Hines Creek, Whites Creek, Muddy Creek, Greasy Run Creek, and Wolf Creek. Other particularly important wetland areas are located in parcels located along the Little Emory River, in the Swan Pond and Clinch River Breeder Reactor area, and on various forested islands in the mainstem of the river. Palustrine emergent and scrub-shrub wetlands are less common, and are usually found at the head of embayments of the smaller tributary streams as they enter the reservoir.

On Watts Bar Reservoir the 100-year flood elevations for the Tennessee River vary from elevation 746.5-feet mean summer level (msl) at Watts Bar Dam (Tennessee River Mile (TRM) 529.9) to elevation 760.0-feet msl at the upper end of Watts Bar Reservoir at TRM 602.3 (downstream of Fort Loudoun Dam). For the Clinch River arm of Watts Bar Reservoir, the 100-year flood elevations vary from elevation 747.1-feet msl at the mouth Clinch River Mile (CRM) 0.0 to elevation 755.3-feet msl at the upper end of Watts Bar Reservoir at CRM 23.1 (downstream of Melton Hill Dam). The Flood Risk Profile (FRP) elevations for the Tennessee River vary from elevation 747.0-feet msl at Watts Bar Dam to elevation 769.3-feet msl at the upper end of Watts Bar Reservoir at TRM 602.3. For the Clinch River, the FRP elevations vary from elevation 748.4-feet msl at the mouth to elevation 759.2-feet msl at the upper end of Watts Bar Reservoir at CRM 23.1. The FRP

elevations are based on the 500-year flood and are used to control flood damageable development for TVA projects and on TVA Lands.

When TVA acquired properties around Watts Bar Reservoir, the land uses were primarily small subsistence farming on marginal land with row crop and pasture areas interspersed with woodlands. Much open land was either planted in pine or reverted naturally to pine and/or hardwoods. Now the TVA public land surrounding Watts Bar Reservoir can be broken into five broad community types; forestland, open/agricultural land, shrub/brush land, wetland/riparian/shallow overbank areas, and residential/suburban habitats. Agricultural and grassland habitats are relatively uncommon on Watts Bar Reservoir properties, comprising only a few hundred acres.

The principal towns on the reservoir are Spring City, Kingston, Loudon, Rockwood, Lenoir City, Oak Ridge and Harriman. There are several barge terminals and industrial park areas near the larger communities, and some concentrations of residential shoreline developments and marinas. However, most of the Watts Bar Reservoir Shoreline can be typified as appearing forested and rural. Of the 721 miles of shoreline on Watts Bar, 340 miles (47 percent) is available for Shoreline Access, which includes current development. Currently there are over 17,000 acres of platted residential property adjacent to Watts Bar Reservoir public lands, which is 1,000 acres greater than the total amount of TVA public land being planned on the Reservoir. It is estimated that approximately 50 percent of the platted area has already been converted to residential housing with complete conversion of most of these areas anticipated.

TVA has several long-term land use agreements with other Federal, State, and local government agencies for wildlife management areas, refuges and parks. TVA provides the use of public land to public agencies and utilities when in the public interest. Most often these are land use agreements for utility or road right of ways, sites for economic development, public works projects (water and sewage), dewatering/pump stations, and community maintenance facilities. Since 1988 there have been 88 new agreements for approximately 603 acres of TVA public land.

Soils occurring in the Watts Bar Reservoir project area with properties to be classified as prime farmland (3,100 acres total) are generally located on the flood plains of the river and smaller streams. They are formed in local alluvium and are loams, silt loams, or sandy loams. In Loudon County, 83 acres of prime farmland soils occur within the project area and in Meigs County, there are 255 acres. The most prevalent in both counties is Lindside silt loam soil with 30 acres in Loudoun and 73 acres in Meigs County. Rhea county prime farmland soils occupy 804 acres with Etowah loam on 200 acres and Waynesboro loam on 193 acres. Most of the geographic reach of the reservoir is located in Roane County where there are 1,904 acres of soil with prime farmland properties in the project area.

Over 700 archaeological resources have been identified on TVA public land surrounding Watts Bar Reservoir from existing data and recent survey results. The eligibility of these or other resources for the National Register of Historic Places (NRHP) would be determined when specific actions are proposed that could potentially affect historical properties. This review would be undertaken in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966. The acquisition of land for the Watts Bar Reservoir by TVA resulted in the removal of most structures and other man-made features. Very few structures remained, though many historic structures do remain on adjacent non-TVA land. A major historic structures survey was done for the 1988 Watts Bar Lands Plan which

included sites on TVA lands and on adjacent non-TVA lands. This survey identified 17 structures listed on the NRHP and 25 eligible for listing; 150 historic structures and/or historic districts of which many are probably eligible for listing, and 171 of which are no longer eligible for listing. The only eligible historic structures on TVA lands are the Watts Bar Steam Plant; the Watts Bar Dam, Locks and Power House; and a number of remaining dwellings from the original construction village (now Watts Bar Resort)

Watts Bar reservoir is bounded by three dams with navigation locks at Watts Bar Lock, Fort Loudoun Lock and Dam is at the upstream limits of the reservoir at TRM 602.3, and Melton Hill Lock and Dam at the furthest extent of Watts Bar reservoir on the Clinch River. In addition, Watts Bar reservoir extends into two navigable tributaries of the Tennessee River; the Emory River, navigable for twelve miles to the town of Harriman, and the Clinch River for 62 miles to the town of Clinton. In 2003, over 1.4 million tons of commercial cargo moved on Watts Bar reservoir. Commodities transported include grains and grain products, iron and steel, minerals, asphalt, sand, salt, and fertilizers.

Watts Bar Reservoir has an estimated1.9 million recreation user days per year and ranks below Norris, Kentucky, and Guntersville Reservoirs in total water-based recreation activities. From a recreational standpoint, Watts Bar Reservoir is a reservoir in transition. It still has remnants of the 1960s and 1970s fish camps and small marinas. However, several marinas and campgrounds are in the process of upgrading their facilities to meet the demands for mooring larger boats and accommodating larger recreational vehicles.

In 2004, there were 50 paved boat ramps on Watts Bar reservoir, and 16 marina facilities with about 1,500 boat docking slips, with an additional 238 out of water storage slips. There are 29 commercial recreation establishments, 36 public areas, three church camps and a Boy Scout camp on Watts Bar Reservoir. The majority of recreations facilities on Watts Bar Reservoir are supplied by the commercial sector. As of the end of 2004, there were 3,591 permitted docks on the reservoir. Finally, Tennessee boater registration data for 2003 (TWRA, 2003) shows that there were 48,848 boats and personal watercraft registered with an address within 25 miles of Watts Bar Reservoir.

Watts Bar Reservoir lies in a region of the Tennessee River Valley noted for a wide variety of scenic resources. The reservoir and floodplain areas include attractive islands, rock bluffs, secluded coves, wetlands and agricultural land which are framed by high wooded ridges. The attractive landscape character extends across TVA public and private land alike and the natural elements together with the communities and other cultural development provide a scenic, relatively harmonious, rural countryside. Land uses influencing visual resources include industrial areas and two TVA facilities (Watts Bar Nuclear Plant and Watts Bar Hydro Plant) as well as state and local parks, Wildlife Management Areas and Refuges, commercial recreation facilities, and an ever-growing assortment of residential development.

The 2000 population of the four counties in the Watts Bar Reservoir area is estimated to have increased by 17.7 percent over the 1990 population. This was a faster growth rate than in either the state or the nation, in contrast to the previous decade in which the area grew much more slowly than the state and the nation. Minorities account for 4.9 percent of the population which is well below the Tennessee state average of 20.8 percent.

In 2002, total employment in the four counties area was 58,215, an increase of 6.9 percent since 1992. This was a much slower rate than in the state and the nation. However, Meigs

County grew much faster and Loudon County somewhat faster than both the state and the nation. Roane County had a decrease in employment of almost 10 percent. The area has fewer workers in the management, professional, and related occupations, as well as in sales and office occupations than does either the state or the nation.

Per capita personal income in the four counties is lower than the state and national averages, ranging from 63.8 percent of the national average in Meigs County to 84.8 percent in Loudon County. The area as a whole averaged 76.0 percent of the national average in 2002, down from 78.5 percent in 1992. The estimated poverty rate in the area in 2002 was 13.2 percent, slightly lower than the state rate of 13.6 percent, but higher than the national average of 12.1 percent.

Except for ozone and particulate matter, all counties that surround Watts Bar Reservoir and their surrounding counties are currently in attainment with the National Ambient Air Quality Standards that establish safe concentration limits for pollutants in the ambient atmosphere. New standards implemented by USEPA in July 1997, include an 8-hour standard for ozone, and 24-hour and annual standards for PM-2.5. Nonattainment counties for 8-hour ozone concentrations include Loudon and Meigs counties. The PM-2.5 nonattainment designations include Loudon County and part of Roane County and the nearby counties of Anderson, Blount, Knox, and Hamilton. The closest Prevention of Significant Deterioration (PSD) Class I area is the Great Smoky Mountains National Park to the east and southeast from Watts Bar Reservoir which is about 20 miles (32 kilometers) distant. Under PDS regulations, certain national parks and wilderness areas are designated PSD Class I air quality areas and are accorded specific protections.

ENVIRONMENTAL CONSEQUENCES

Under any alternative, impacts to sensitive resources, such as endangered and threatened federal- and state-listed species, cultural resources, and wetlands, would be mitigated through regulatory requirement and commitment. Future residential, industrial, and recreational developments on adjacent private property or on TVA property have the potential to result in water quality effects due to increased soil erosion, chemical usage, and sewage loading. However, these effects can be avoided or minimized by use of vegetated buffer zones and development restrictions such as those required for residential permitting according to TVA's Shoreline Management Policy. In implementing any of the three alternatives, impacts to floodplain values would be insignificant and any development proposed in the 100-year floodplain would be subject to the requirements of Executive Order 11988 (Floodplain Management). None of the alternatives directly result in any impacts on air quality. Indirectly, there could be adverse air quality impacts from specific future proposed actions on some acres designated Economic Development. However, those proposed actions would be carefully reviewed for approval or disapproval and impacts would be avoided or mitigated in accordance with PDS/NSR requirements implemented through the permitting process. Conversion of prime farmland could amount to as much as 299 acres; however this would have an insignificant impact to the region. In site-specific cases where some wetland impacts do occur, mitigation requirements would offset any long-term loss of wetland functions. When practicable, impacts to wetlands would be mitigated by avoiding these areas and including small upland buffers. There may also be some incremental clearing of wetland vegetation by landowners resulting in some minor, cumulative loss of wetland function, primarily shoreline stabilization, wildlife habitat provision, and plant community diversity.

In implementing the No Action Alternative, potential impacts to threatened or endangered species are expected to be minor and insignificant and could be further reduced for aquatic species by the use of Best Management Practices (BMPs) for soil disturbances. There would be some potential for impacts to water quality, due to release of toxic substances, erosion, and nutrient loading from economic, and recreational development. About 1,500 acres of public land would eventually be used for private Economic Development uses. There would be some potential for fragmentation to the terrestrial ecology resource; however, forest areas would generally remain forested. There would be no Integrated Resource Development Plan (IRM Plan) to manage natural resources; however TVA would continue to use the existing natural resource management plan for the Lower Watts Bar Unit. The eventual use of approximately 3,400 acres of high quality terrestrial habitat to economic or recreation development would be a large loss of terrestrial habitat on Watts Bar Reservoir. There would be no impacts to aquatic ecology, managed areas, navigation, socioeconomic, environmental justice, and visual resources. There would be a loss of existing informal recreation opportunities at developing sites. Some insignificant noise impacts would occur eventually at the economic development sites. The 1988 Plan does not provide for specific preservation of archaeological resources; however, TVA will comply with regulatory requirements of NHPA and the Archaeological Resources Protection Act. Site-specific activities proposed in the future would be approved, mitigated, or denied according to the significance of cultural resources present.

Under Alternative B, the greatest amount of land would be allocated for Economic and Recreation Development at both the former Clinch River Breeder Reactor and Lowe's Branch sites. Potential impacts to threatened or endangered species are expected to be slightly greater than alternative A, but still minor and insignificant; and could be further reduced for aquatic species by the use of BMPs for soil disturbances. There would be greater but still insignificant potential for impacts to water quality. About 2,300 acres of public land would likely be converted to private Economic Development uses. There would be the greatest potential for fragmentation to the terrestrial ecology resource under this alternative. The eventual conversion of approximately 3,700 acres of high quality terrestrial habitat to economic and recreation development would be a greater loss of habitat than alternative A. There would be potential impacts to the Grassy Creek Habitat Protection Area from the proposed economic development on the former Clinch River Breeder Site. There would be some accelerated shoreline erosion from the loss of riparian vegetation. There would be some benefits from the implementation of the IRM Plan. The barge terminal on Parcel 218 would have insignificant impacts from new adjoining marina facilities. There would be some impacts to visual resources. This alternative would have the greatest positive impacts for economic development but negative impacts to terrestrial ecology. There would be an adverse loss of existing informal recreation opportunities at developing sites. The greatest, but still insignificant, noise impacts would occur at the economic development sites. A phased identification and evaluation procedure would be established for future site-specific activities where impacts would be approved, mitigated, or denied according to the significance of cultural resources present.

Under Alternative C, the greatest amount of land would be allocated for Natural Resource Conservation. This alternative would provide the greatest protection for threatened and endangered species with no impacts to sensitive plants and beneficial impacts for sensitive terrestrial and aquatic animals. There would be beneficial potential for impacts to water quality. Only 52 acres of public land would likely eventually be converted to private Economic Development uses. There would be benefits from the complete implementation of the IRM Plan. The retention of high quality terrestrial habitat would be a benefit to

terrestrial ecology on Watts Bar Reservoir. There would no impacts to Managed Areas or informal recreation opportunities. The barge terminal on Parcel 218 would have insignificant impacts from new adjoining marina facilities and a potential barge terminal would be lost on Parcel 298. There would be some impacts to visual resources. This alternative would have almost no opportunities for future development on public land and no potential new jobs. The least noise impacts of all the alternatives would occur. A phased identification and evaluation procedure would be established for future site-specific activities where impacts would be approved, mitigated, or denied according to the significance of cultural resources present.

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Acronyms and Abbreviations

1988 Plan	1988 Watts Bar Reservoir Land Management Plan
APE	Area of Potential Effects
ARPA	Archaeological Resources Protection Act
BMPs	Best Management Practices
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CRM	Clinch River Mile
cfs	Cubic Feet Per Second
DEIS	Draft Environmental Impact Statement
DO	Dissolved Oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
ECSA	Ecological Study Area
EMR	Emory River Mile
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FPPA	Farmland Protection Policy Act
FRP	Flood Risk Profile
GIS	Geographic Information System
HPA	Habitat Protection Area
LWBU	Lower Watts Bar Unit
mgd	Million gallons per day
mg/kg	Milligrams per kilogram
msl	mean sea level
NAGPRA	Native American Graves Protection and Repatriation Act
NWI	National Wetland Inventory
NEP	Nonessential Experimental Population
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNL	National Natural Landmark
NOI	Notice of Intent

NPS	Non Point Pollution
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
Plan	Reservoir Land Management Plan
PCRM	Piney Creek River Mile
PPNL	Potential National Natural Landmark
PPS	Protection Planning Sites
PRM	Piney River Mile
PSD	Prevention of Significant Deterioration
SAHI	Shoreline Aquatic Habitat Index
SAS	Statistical Analysis Systems
SCS	Soil Conservation Survey
SHPO	State Historic Preservation Officer
SMI	Shoreline Management Initiative, TVA
SMP	Shoreline Management Policy, TVA
STATSGO	State Soils Geographic Database
SWA	Small Wild Area
TDEC	Tennessee Department of Conservation
TOS	Tennessee Ornithological Society
TRM	Tennessee River Mile
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
U.S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WBWG	Watts Bar Working Group
WMA	Wildlife Management Area
WOA	Wildlife Observation Area
WROS	Water Recreation Opportunity Spectrum